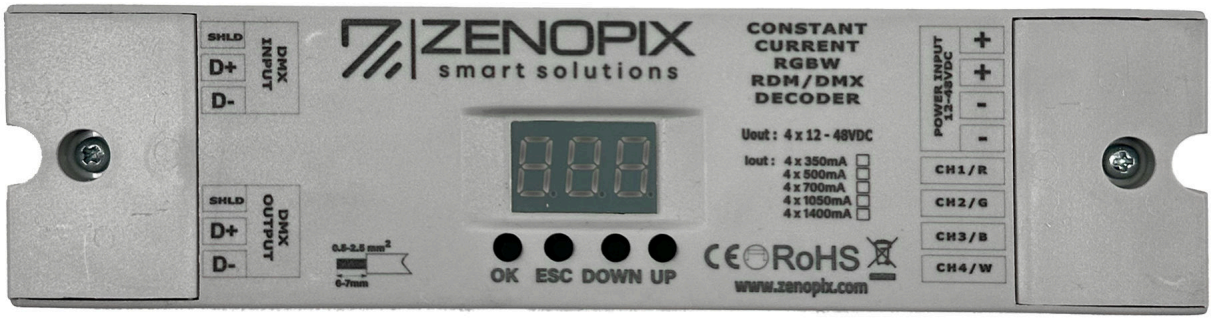
ZENOPIX
smart solutions

Your Solution Partner in Lighting Control

DMX & RDM ENCLOSED CONSTANT CURRENT DECODER WITH BUTTONS

USER MANUAL



Version 3 / October 2026



Thank you for choosing the Zenopix DMX & RDM Enclosed Constant Current Decoder with Buttons. Please read this booklet and the product user manual before using the product. The user manual is available on our website. If you experience any technical problem, you can contact our company using the information below and receive technical support.

Company Information and Contact Address

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The DMX & RDM Enclosed Constant Current Decoder with Buttons *is a registered product of Zenopix® Limited Company.*

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Safe Use

Use the device only in dry environments (indoors). The IP rating of the device is IP20. Do not use the device in humid environments and avoid contact with water or other liquids. Switch off the power if you will not use the device for a long time. The use of galvanic isolation is always recommended. Do not remove any part from the unit. Do not connect the unit to an ungrounded circuit. Do not connect the unit to LEDs that are switched on. Connect the unit only to LEDs and controllers that are initially switched off. There are no user-serviceable parts inside or outside the interface. Repair service is the sole responsibility of the manufacturer. If the interface appears to be defective, please contact your dealer. After the warranty period has expired, you can contact your supplier or the manufacturer about having the unit repaired, if possible, for a service fee. This device must be used by professionals. The device is not designed to be operated by non-professionals or children.

Warranty Information

The Zenopix DMX & RDM Enclosed Constant Current Decoder with Buttons comes with a 2-year manufacturer's warranty, extendable to 5 years with an optional 3-year extension. Detailed information is available in the product warranty certificate or on our website.

Box Contents

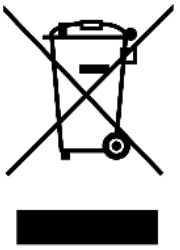
1× Zenopix DMX & RDM Enclosed Constant Current Decoder with Buttons

1× Device Test Report

NOTE: After opening the package, check its contents and inspect the device for damage! If anything is missing or damaged, contact your supplier. Do not use the device if it appears damaged!

Information on Human and Environmental Health

If the information in the User Manual is fully followed, this device poses no risk to human health or the environment. The device must not be disposed of with household waste; it must be delivered to an electrical and electronic equipment recycling center. It must be recycled or disposed of without harming nature or human health.



Introduction

The ZENOPIX DMX & RDM Enclosed Constant Current Decoder with Buttons is a professional LED driver that processes standard DMX512 signals and supplies constant current to high-power LEDs. Thanks to integrated RDM (Remote Device Management) support, it communicates bidirectionally with the main control unit, allowing device parameters to be easily configured and monitored remotely. Over a wide 12–48VDC operating voltage range, it provides flicker-free, smooth dimming over the 0%–100% range for outstanding performance in architectural and stage lighting applications, while its built-in gamma correction allows precise adjustment of brightness curves.

In addition to a soft-start feature that limits inrush current at power-up, the device is equipped with under-voltage lockout (UVLO), over-temperature (OTP) and output over-current (OOCP) protection to prevent damage to the system and LEDs.

Features

- Operating voltage up to 48V.
- Flicker-free thanks to high-frequency switching.
- RDM support.
- Easy installation.
- Built-in gamma correction.

Application Areas

- Stage Lighting
- Architectural Lighting Applications
- High-Power LED Wall-Washer Fixtures
- Parallel Lighting Systems with Common Anode Connection
- Professional LED Driving and Control Projects

Safety Instructions

To prevent misuse of the device, damage or personal injury, please follow the instructions below:

⚠️	This device operates at low voltage (DC 12-48V). Do not use lower or higher voltages. Do not apply reverse-polarity voltage to the device.
⚠️	Any external power supply to be connected must be fused according to its output power and/or protected against short circuits.
⚠️	It is the user's responsibility to protect the device against lightning, electric shock and high-voltage surges. Make sure that all necessary electrical surge protection measures have been taken at the installation site.
⚠️	In high-current applications, cable cross-sections and connectors must be selected according to the maximum current drawn by the device to prevent line losses and heating. Improperly sized cables and connectors can overheat, cause voltage drop and increase the risk of a short circuit, creating a fire hazard. The user is solely responsible for correct sizing.

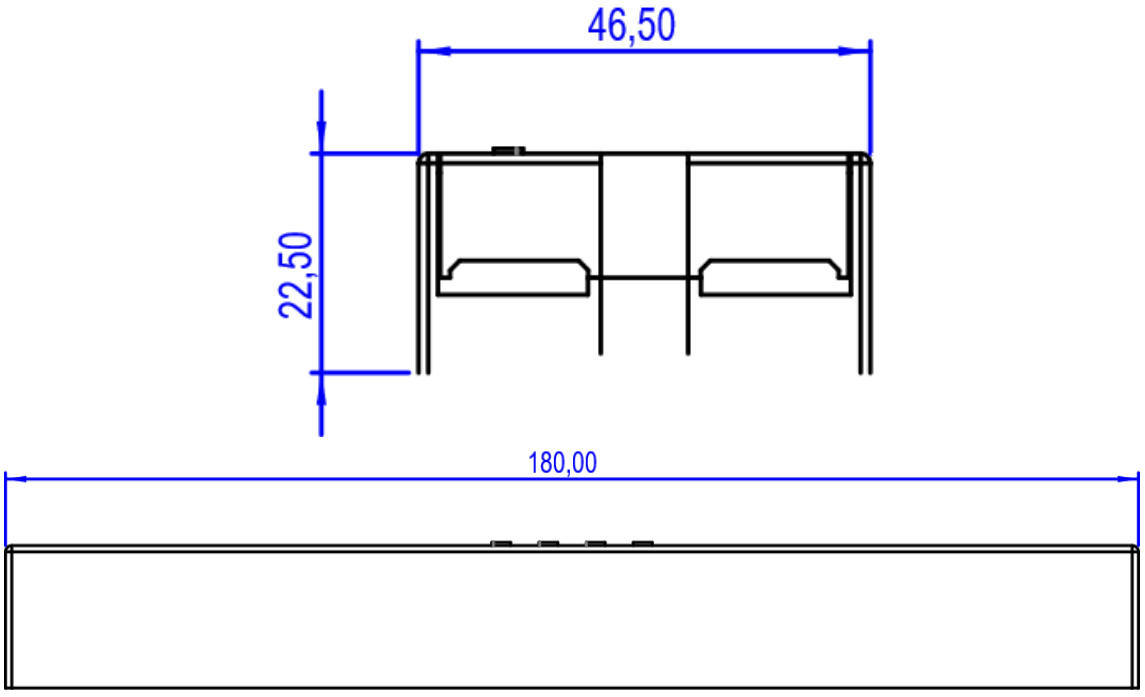
Technical Specifications

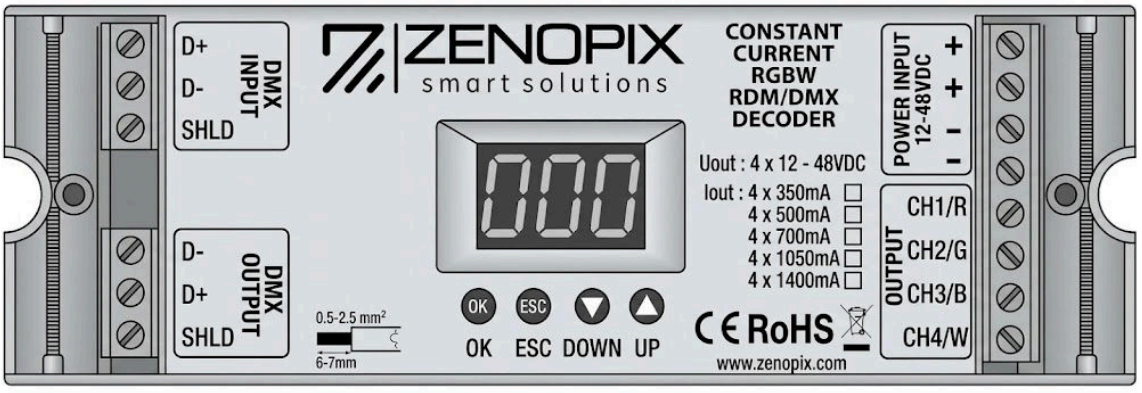
Dimming Interface	DMX512/RDM
Input voltage range	12-48VDC
Input voltage (Abs. Max.)	50V DC
Output voltage range	0V- Vin
No-load power	<1W
Firmware update	Updated over RDM with the Zenopix Explorer software.
Drive Method	Common Anode (LED + terminals common)
Output current options *1	Factory-set, 150mA to 1400mA.
Current hysteresis window ΔI_{HYS}	±%5
Max. cont. output power (4CH)	~201.6W (@4CH/48V 1050mA, %100 DIM) ~134.4W (@4CH/24V 1400mA, %100 DIM)
Dimming Range	0~100% (0.4% resolution via DMX signal)
Dimming method	PWM
PWM switching frequency	500 kHz
Efficiency	>90% efficiency (Test: 36V, 700mA, 9 LEDs in series)
Dimensions	180 x 46.5 x 22.50mm (L x W x H) with terminal blocks
Weight	130g
Operating temp./humidity	-10°C, +70°C / 20 ~ 70%RH, non-condensing
Storage temp./humidity	-20°C ~ 80°C, 0~ 80% RH, Non-Condensing
Certificates	CE, RoHS
IP Rating	IP20

***1:** The current value can be set according to the wattage requested by the user. Please do not hesitate to contact us for your special current requirements.*

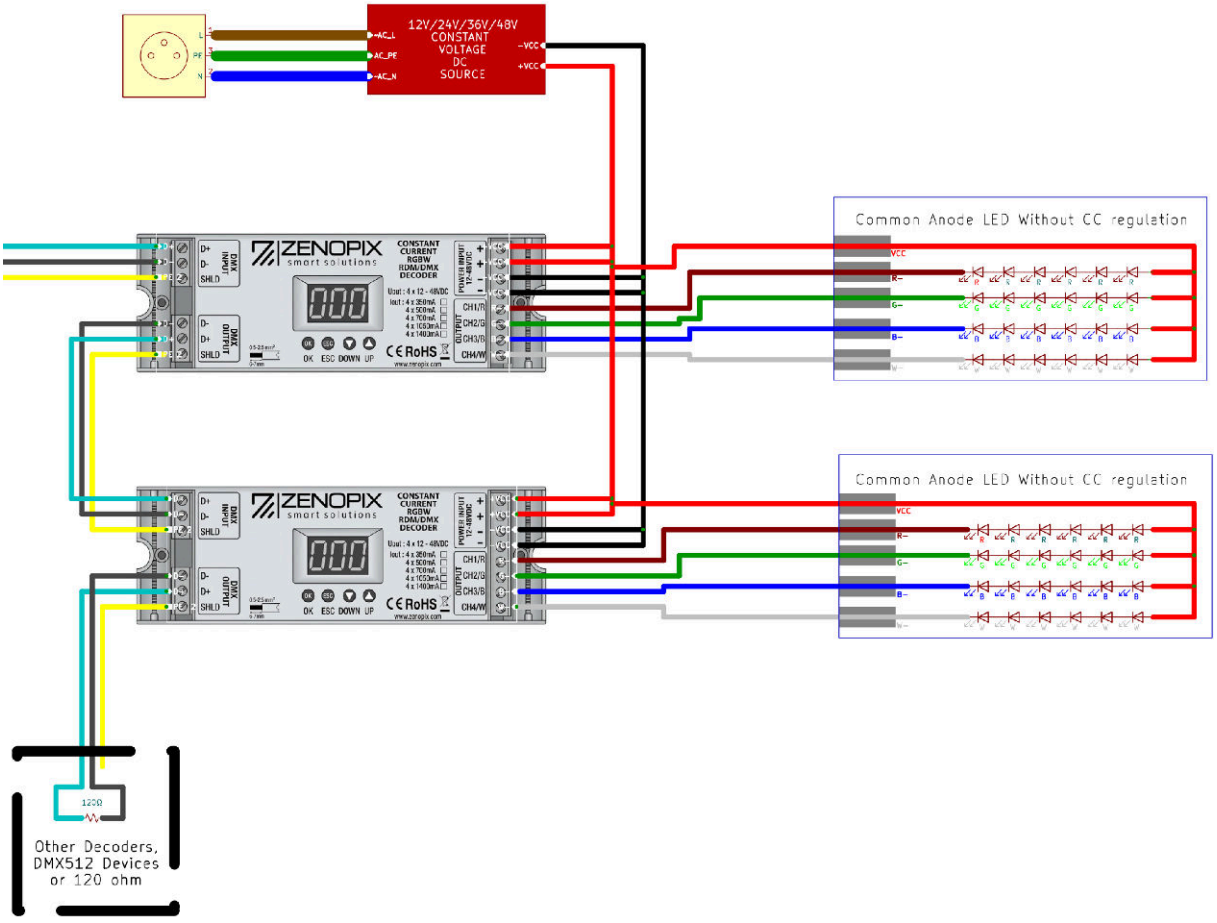
Recommendation: You can choose a DC power supply that meets your current and voltage requirements. A power supply with short-circuit protection is recommended. For example, Mean Well LRS-350-24 can be used.

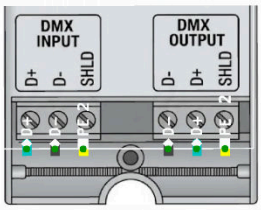
Device Dimensions





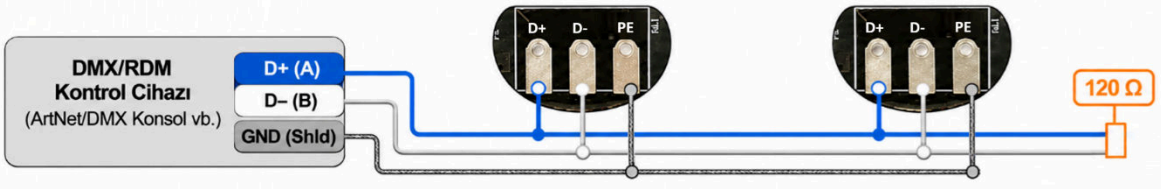
Pin Connections





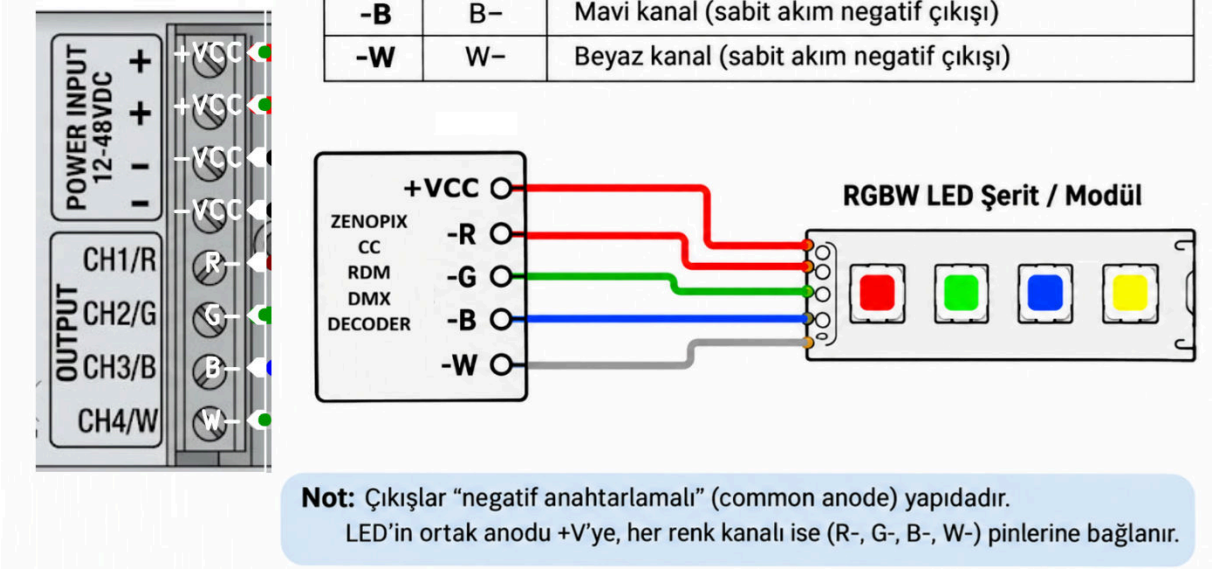
Pin	DMX/RDM (RS-485)	Açıklama
A	D+ (Data +)	Pozitif (+) hat
B	D– (Data –)	Negatif (–) hat
PE SHLD	Shield	Kablo ekranı Protective Earth





- Bağlantı eşleştirmesi (PCB'ye uygun): **A** = D+ (Data +), **B** = D– (Data –), **Shld** = ekran.
- DMX/RDM (RS-485) için 120 Ω empedanslı, bükümlü çift, ekranlı kablo kullanın.
- Hat topolojisi: tek hat (daisy-chain). Yıldız (star) bağlantıdan kaçının.
- Hat sonunda **D+ (A)** ile **D– (B)** arasına 120 Ω terminasyon direnci bağlayın.

Pin	Adı	Açıklama
+V	V+	Besleme pozitif (+) (genelde 12 VDC veya 24 VDC)
-R	R–	Kırmızı kanal (sabit akım negatif çıkışı)
-G	G–	Yeşil kanal (sabit akım negatif çıkışı)
-B	B–	Mavi kanal (sabit akım negatif çıkışı)
-W	W–	Beyaz kanal (sabit akım negatif çıkışı)



Not: Çıkışlar "negatif anahtarlamalı" (common anode) yapıdadır.
LED'in ortak anodu +V'ye, her renk kanalı ise (R-, G-, B-, W-) pinlerine bağlanır.

- When wiring the device, select a suitable cable type and cross-section, and use cables and connectors rated for the required current.
- A data cable impedance of 120 Ω is recommended. Half-duplex RS485 or DMX cable is recommended.
- If your LED current is >5A, joining the +(Anode) terminals at the terminal blocks or solder pads on the device is not recommended. At high currents, it is better to distribute the +(Anode) terminals of the LEDs from the power supply in a star topology.
- The product has power inputs on both sides and can carry current through the product provided the total current is <3A. However, carrying power through the product is not recommended. In applications where the total current exceeds 3A, distribute the + (Anode) terminals of the LEDs from the power supply in a star topology.
- Please make sure your LEDs support common anode (+ terminals can be shared, -(cathode) terminals are independent).

- A 120 Ω termination resistor at the end of the DMX line is strongly recommended.
- Wiring must be performed by qualified personnel.
- Avoid reverse polarity during connection.

When making the RDM/DMX connection, connect the devices in a daisy-chain structure (so that the DMX output of one device is connected to the DMX input of the next device). Never use a Star topology on the DMX line. Make the cable connections between terminals bearing the same name label. It is recommended to use cables specifically manufactured for RS485***1.** Do not route RDM/DMX signal lines near power lines carrying high voltage or high current (for example, asynchronous motor supply cables). For reliable signal transmission, connect a 120 Ω termination resistor to the DMX OUT port of the last device.

****1 Recommendation:*** *Recommended Belden cables for DMX are listed below. Make sure you use a twisted-pair cable with an impedance of 120 Ω. If the cable will be used outdoors, choose cables with high UV resistance.*

Area of Use	**Cable Type / Feature**	**Recommended Belden Cable**	**Equivalent Local Cable Designation**
Indoor	Standard (PVC Jacket)	Belden 9841	LI2Y(St)CH / LIYCY(TP)
Indoor	Halogen-Free (LSZH/ HFFR)	Belden 9841NH	LI2Y(St)CH
Outdoor	UV Resistant	Belden 3105T	LI2Y(St)C2Y
Outdoor	Armored (Underground Runs)	Belden 9841LS	LI2Y(St)C2Y-SWA

LED Selection

To get flawless dimming performance from your DMX Constant Current decoders and to maintain the thermal/electrical stability of the device, the following rules must be strictly observed when selecting and connecting LEDs.

Information Note for LED Module Designers

For the decoder to provide stable current regulation and remain stable during PWM/linear dimming transitions, the total forward voltage (V_{LED}) of the LED modules to be connected should not exceed 75% of the input supply voltage (V_{IN}). Exceeding this limit may cause a drop in output current or loss of regulation.

Recommended Number of Standard LEDs in Series per Channel: When using standard lighting LEDs with an average operating voltage of 3V, the recommended number of LEDs in series per channel, depending on your power supply voltage, is as follows:

- For 12V DC Supply: 3 LEDs in Series *(Approx. 9V)*
- For 24V DC Supply: 6 LEDs in Series *(Approx. 18V)*
- For 36V DC Supply: 9 LEDs in Series *(Approx. 27V)*
- For 48V DC Supply: 12 LEDs in Series *(Approx. 36V)*

Device Settings (via RDM)

This device supports the standard ANSI E1.20 RDM protocol.

This model has a physical display and buttons. These adjustments can be made using the button and screen. All device parameters, including DMX Start Address, Channel Modes, and Gamma Correction, can be configured directly from the device or remotely via the RDM protocol (using Zenopix Explorer software or standard RDM controllers). The RDM parameter codes (opcodes) used in the device configuration are listed below:

1. ***DMX Start Address - RDM Parameter Code: 0x00F0***

   The device's start address in the DMX512 universe (assignable from 1 to 512). Starting at this address, the device processes the number of consecutive DMX channels specified by the selected mode. The default start address is 1.

2. ***Channel Modes and Count - RDM Parameter Code: 0x8003 (CH1 to CH4)***
   Determines how many DMX channels control the device and how these channels are mapped to the physical outputs. The default channel count is 4. Select one of the four modes below:

Mode	DMX Channel Count	Output Mapping
CH1	1	All outputs follow channel 1.
CH2	2	Outputs 1-2 → channel 1; 3-4 → channel 2.
CH3	3	Output 1 → channel 1; Output 2 → channel 2; Outputs 3-4 → channel 3.

CH4	4	Each output follows its own channel independently.

3.Gamma Correction - RDM Parameter Code: 0x8004

Gamma correction adjusts DMX dimming levels to match human brightness perception, producing smooth, natural transitions. Via RDM, it can be set between γ 1.0 and γ 2.8. The default gamma correction value is 1.0.

For more detailed information on RDM parameters and packet structure, see the Zenopix RDM user manual page. For managing and configuring the device over the RDM protocol, Zenopix Magus can be used as the RDM master device; you can also use the Zenopix Explorer software for RDM monitoring and management.

Device Menus (Enclosed Models with Buttons)

You can control the display menu with the buttons on the device.

Saved values show lit decimal points; they turn off while the value is being changed. Menu behavior follows software 2.3.4.

OK

"OK"; Press and hold for about half a second to enter the menu or save the value. Short presses are ignored.

ESC

"ESC"; Returns to the menu list from the value screen. Ends test. No saving.

DOWN

"DOWN"; Previous menu item; on the value screen, decreases the value by one.

UP

"UP"; Next menu item; on the value screen, increases the value by one (repeats when held).

MENU

#MENU "P01"; DMX start address. 001–512. Default 001.

#MENU "P02"; Channel mode. CH1–CH4. Default CH4.

#MENU "P03"; PWM frequency. 500 kHz (Constant).

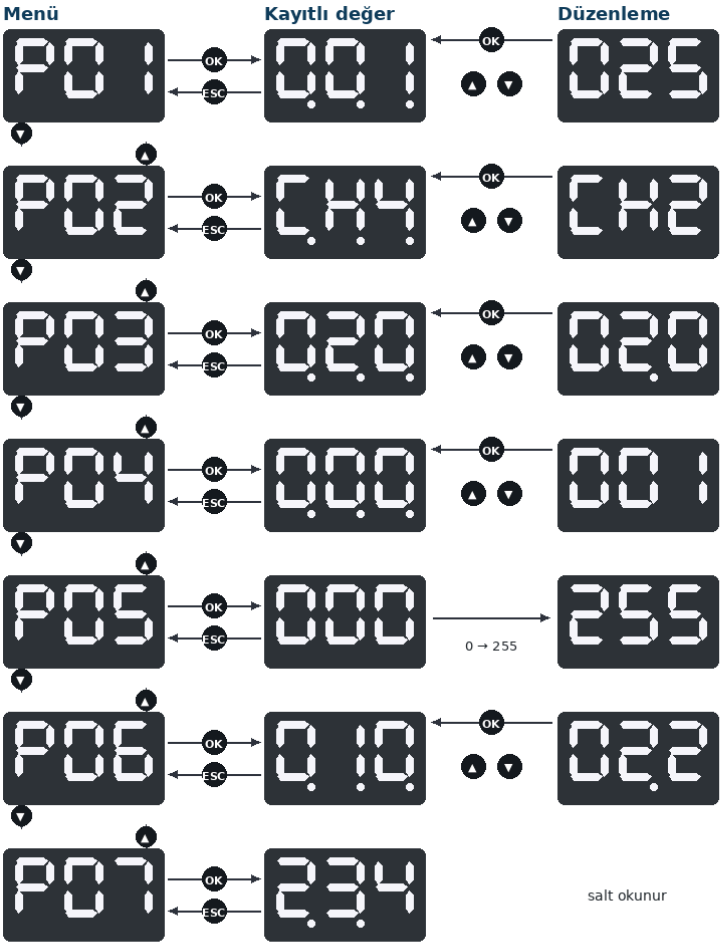
#MENU "P04"; Addressing via DMX line. 000 off, 001 on. Default 000.

#MENU "P05"; Output test. Display cycles through 000–255. DMX input is ignored during the test.

#MENU "P06"; Gamma correction. 1.0–2.8. Default 1.0.

#MENU "P07"; Software version. 2.3.4 in this version. Cannot be changed.

Menu Diagram



▲▼ P01–P07 halkası. P07'den sonra P01 gelir.
OK girer veya kaydeder. ESC menüye döner, kaydetmez.
P05: 000–255 sayar, DMX kapalı. P07: yalnız sürüm.

Addressing on the Device (P01)

P01 changes the DMX start address and writes it to non-volatile memory.

Addressing sequence on the display:

Find P01 with UP/DOWN; press OK to open the saved address. Pick a new address (001–512) with UP/DOWN; OK saves, ESC returns to the menu list.

Starting from the selected address, the device uses as many DMX channels as set in P02. The last channel used must not exceed 512.

Channel Selection (P02)

Outputs are mapped by the saved channel mode as follows. Output order: 1 red, 2 green, 3 blue, 4 white. The default mode is CH4.

Mode	DMX	Output mapping
CH1	1	All four outputs follow channel 1.
CH2	2	Outputs 1-2 → ch 1. Outputs 3-4 → ch 2.
CH3	3	Output 1 → ch 1, Output 2 → ch 2, Outputs 3-4 → ch 3.
CH4 (Default)	4	Each output follows its own channel (1–4).

Frequency Setting (P03)

Reserved. Sets the driver PWM frequency; changing it is not recommended.

Addressing via the DMX Line (P04)

000 (off) is the default; the address then changes only via the display or RDM. With 001 (on), the device accepts a special address command on the DMX line: not an RDM packet, but a DMX frame with start code 0x00, always read from channels 1–14 regardless of the device's own address. The command is ignored during the test.

Channels 1–6 and 9–14 are a fixed signature: 55 0F 2C AA 35 03. Channels 7 and 8 carry the address; each received byte is bit-reversed.

New address = (bit-reversed channel 7 AND 7F) × 64 + (bit-reversed channel 8 AND 3F) + 1. If the signature does not match, the address is unchanged; if it matches, the value is saved to non-volatile memory as P01.

Address	Channel 7	Channel 8
1	00	00
10	00	90
65	80	00
512	E0	FC

Because the command uses channels 1–14, a decoder addressed in this range may interpret these bytes as dimming levels during the command frame. If the addressing device writes the address only via RDM, leave P04 at 000; if it uses the DMX signature frame, set P04 to 001.

Test procedure on the device (P05)

After connecting and powering the device, select P05 with UP/DOWN and press OK to start. The displayed value rises from 000 to 255 and returns to 000; the test then advances to the next output in the saved channel mode order. In CH1, all four outputs ramp up and down together. DMX input is ignored during the test. ESC or another menu stops it. The test is not saved.

Gamma Correction (P06)

Gamma is the curve applied to the DMX level before it is converted to a PWM ratio. The display ranges from 1.0 to 2.8 in steps of 0.1. The default 1.0 is linear. The exponent applied is the value shown on the display.

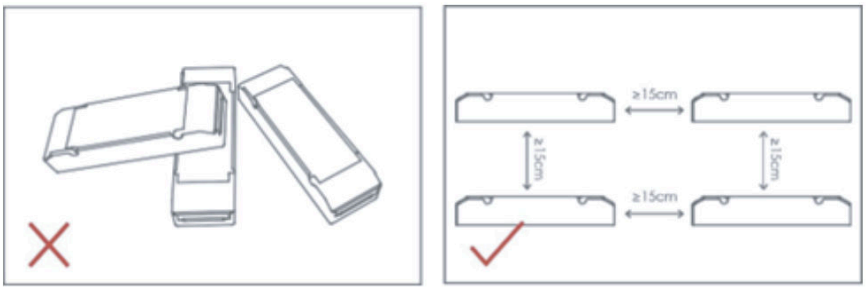
Output = integer part (255 × (DMX ÷ 255) ^ γ). 0 and 255 stay the same for every gamma. Intermediate levels get smaller as gamma increases. The calculation is done after channel merging. PWM percentage = integer part (output × 100 ÷ 255).

DMX	**γ 1.0**	**γ 2.2**	**γ 2.8**
0	0	0	0
64	64	12	5
128	128	55	37
255	255	255	255

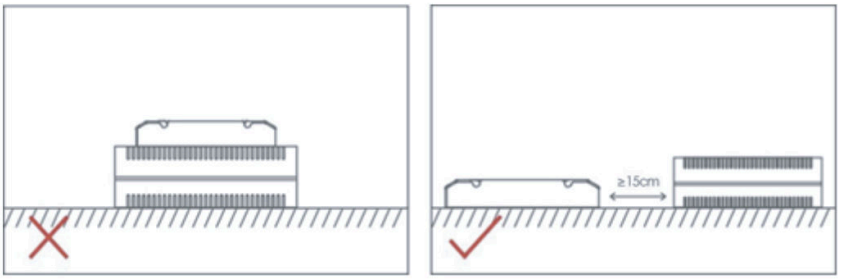
Version information (P07)

P07 displays the software version as a read-only value. The display shows 2.3.4. The same number is also returned in response to an RDM software version query.

Installation and Precautions



Please do not stack the products on top of each other. Leave **more than 15 cm** between two devices so as not to adversely affect heat dissipation or the service life of the products.



Please do not place the products on top of LED drivers. Leave **at least 15 cm** between the product and the driver to ensure proper heat dissipation and to prevent shortening the service life of the devices.

WARNINGS

- The products must be installed by qualified professionals.
- This product has an IP20 protection rating and **is not waterproof**. Please protect it from physical impact, sun, water and rain. This product is not suitable for direct outdoor installation. If it will be used outdoors, make sure it is mounted in a waterproof enclosure. The user is responsible for outdoor use. Good heat dissipation will extend the service life of the products. Please ensure good ventilation.
- Make sure the operating voltage meets the product specifications.
- The cable gauge used must be sufficient to supply the connected lighting fixtures, and the cable connection must be secure.
- Before switching on the products, please make sure that all wiring is correct, as an incorrect connection may damage the lighting fixtures. If a fault occurs, please do not attempt to repair the products yourself. If you have any questions, please contact your suppliers.
- This manual is subject to change without prior notice. If you have any questions, please do not hesitate to contact us.

Technical Support

If you have further questions about the use of the Zenopix DMX & RDM Enclosed Constant-Current Decoder with Buttons or technical problems, use the following resources for troubleshooting:

- Read the Zenopix Constant Current Decoder user manual
- Contact your supplier or sales representative.
- Check our website for the latest information
- For any technical problem, you can contact us directly at info@zenopix.com.

Frequently Asked Questions (FAQ)

Can I use multiple DMX & RDM Enclosed Constant-Current Decoder with Buttons decoders at the same time?

Yes, you can.

Does this decoder support RDM?

Yes, the device supports RDM. For management via RDM, you can use the Zenopix Magus device with the Zenopix Explorer software.

What equipment is recommended for use with this device?

It is recommended to use it with Zenopix Magus for RDM applications, and with Zenopix Elea or Zenopix AER for DMX-only applications. The device can also operate with all controllers compliant with the DMX512 Standard.

I am experiencing flicker or latency in LED fixtures. What could be the cause?

- No 120 Ω termination resistor at the end of the DMX line.
- The cable between the decoder and the LEDs is too long (>5 meters)
- The power supply cannot provide sufficient current.

- Non-standard cabling or exceeding the maximum signal transmission distance (>100 meters).
- Too many end nodes (decoders) on the line (>32)
- Delay of data packets due to heavy traffic on the Ethernet network

The distance between the controller and the decoders is too long (>100 meters). What should I do?

To extend the signal cable or prevent signal degradation, see the Zenopix Repeater products.

How can I address the devices?

You can address the devices using Zenopix Magus or any standard RDM controller. For easy addressing in the field, see the Zenopix RDM/DMX Address Writer product.

On models with a display and buttons, you can also use the device buttons to set the address in the P01 menu (see Addressing on the Device (P01)).

How many devices can I use on one DMX/RDM line?

The recommended maximum number of devices per line (Universe) is 32. For applications with more than 32 devices per line, 1 signal amplifier or repeater must be used for every 32 devices.

Can I use the device channels in parallel?

Yes, in Zenopix CC decoder series, output channels can be combined to increase the current. The resulting current equals the sum of the individual channel currents. This requires additional configuration via RDM.

Channel Mode Selection and Combining Output Terminals

According to the saved channel mode, the outputs are physically combined and mapped as shown in the table below. In 4-channel mode, the output order is 1 red, 2 green, 3 blue, 4 white. The default mode is CH4. This parameter can be configured remotely via RDM as well as from the device menu.

Mode	Output mapping
1 Ch.	All four outputs are driven by channel 1 data.
2 Ch.	Outputs 1 and 2 → channel 1 data; Outputs 3 and 4 → channel 2 data.
3 Ch.	Output 1 → channel 1; Output 2 → channel 2; Outputs 3 and 4 → channel 3 data.
4 Ch.	Each output follows its own channel (1–4).

Order Code

PRODUCT CODE	RDMXCC	015	BB	ST
Capacity				
150mA per channel		015		
350mA per channel		035		
500mA per channel		050		
700mA per channel		070		
1050mA per channel		105		
1400mA per channel		140		
Enclosure Type				
Bare Board (PCB Only)			BB	
Enclosed			EB	
Enclosed with Display and Buttons*			DB	
Connection				
Screw Terminal Blocks				ST
Pluggable Terminal Blocks				PT
Solder Pads without Terminal Blocks				SL

**** For Enclosed with Display and Buttons, only the Screw Terminal Bloks option is available.***

***** The standard current values are 150mA, 350mA, 500mA, 700mA, 1050mA and 1400mA. Units with intermediate current values are produced and shipped from the factory.***
Contact your sales representative for custom values.

Your lighting solution partner

Zenopix is an R&D, technology and manufacturing company specialized in lighting control systems, built on nearly twenty years of expertise in electronics and software.

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